REMARKS

Administrative Overview

Claims 24, 26–34, 36–38, 40–44, 46, 47, and 49-52 were examined in the Office action of January 11, 2007. The Office action maintains the rejection of claims 24, 26–31, 36–38, 40, 41, 46, 47, and 49-52 under 35 U.S.C. § 103(a) in view of a combination of U.S. Patent No. 5,452,723 (**Wu**) and U.S. Patent No. 6,571,118 (**Utzinger**). The Office action also maintains the rejection of claims 32-34 and 42-44 under 35 U.S.C. § 103(a) in view of a combination of **Wu**, **Utzinger**, and U.S. Patent No. 5,999,844 (**Gombrich**).

Applicants respectfully traverse these rejections, as explained herein. Without acquiescing to the rejections, Applicants amend independent claims 24 and 38 to remove the phrase, "at least in part"; no new matter is added thereby.

Following entry of this paper, claims 24, 26–34, 36–38, 40–44, 46, 47, and 49-52 will still be pending.

Claims 24, 26–31, 36–38, 40, 41, 46, 47, and 49-52 are patentable over **Wu** in view of **Utzinger**

The techniques described in both **Wu** and **Utzinger** are essentially fluorescence-based tissue classification techniques. Reflectance data are used in **Wu** and **Utzinger** simply to adjust the fluorescence data (**Wu**), or are combined together with fluorescence data at multiple excitation wavelengths in a statistical algorithm (**Utzinger**).

Neither **Wu** nor **Utzinger** teaches reflectance-based classification. For example, neither **Wu** nor **Utzinger** teaches classifying test specimens based on reflectance spectral data, where fluorescence data (obtained with substantially monochromatic radiation) is used in a separate, previous step to screen the test specimens for a given condition prior to the reflectance-based classification.

The Office action alleges the following:

> **Wu** et al. clearly includes the steps of obtaining fluorescence and then reflectance data and this would necessarily suggest that one is used to screen and the other for further analysis, especially since spectral data is obtained in that order. [emphasis added]

Applicants respectfully argue that **Wu** does not teach obtaining fluorescence and then reflectance data. Regarding the order in which data are obtained, **Wu** teaches the following at col. 5, lines 15-19, and in Figure 2, reproduced as follows (underlining and circling are added):

FIG. 2 shows a flowchart of a preferred method for extracting diagnostic information from optically thick turbid tissue using the techniques of this invention. The diffuse reflectance R and the bulk fluorescence F spectra are collected 50 from the tissue being analyzed. Collection of the R and F spectra can be accomplished using the spectroscope 10 of FIG. 1.

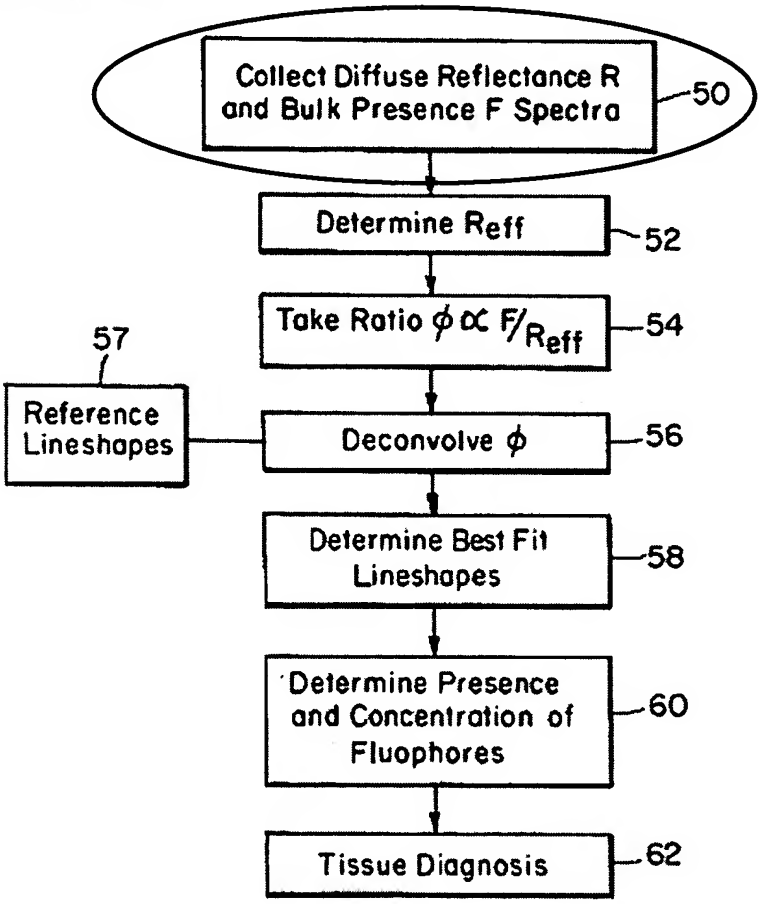


FIG. 2

Figure 2 indicates **Wu** obtains reflectance data and fluorescence data at roughly the same time. Furthermore, the order in which the data are obtained is largely irrelevant, because the order in which data are obtained does not suggest how each type of data is processed or used in the classification of tissue.

Thus, it is not true that the order of data acquisition would suggest which type of data is used to screen and which type is used for further analysis. There is no indication in the cited art, in the first place, that one data type can be used to screen, while the other data type can be used for further analysis, much less an indication of which type is used for which step.

None of the cited art, alone or in combination, teaches or suggests screening a specimen for a given condition using fluorescence spectral data with illumination at one excitation wavelength, and, where the result is not determinate, using reflectance spectral data to classify the specimen.

Wu appears to teach "applying a diffuse reflectance spectrum to a fluorescence spectrum" to correct fluorescence data obtained from thick samples so that the resulting fluorescence spectrum is the same as would be obtained from thin (10 μm) tissue slices -- see col. 3, lines 1-12, of **Wu**, reproduced below (emphasis added):

> The photon migration picture is extended to model the fluorescence from turbid media such as human tissue. The photon migration approach suggests that the distortion in a fluorescence spectrum caused by the interplay of scattering, absorption, geometry and boundary conditions can be precisely removed by measuring the diffuse reflectance spectrum over the same wavelength range and in the same manner as the fluorescence spectrum, and applying this diffuse reflectance spectrum to the fluorescence spectrum in a well defined manner. The result is the same intrinsic fluorescence spectrum as would be obtained from thin (10 μm) tissue slices which are not distorted by these factors.

Wu does not teach or suggest using reflectance spectral data itself to classify a test specimen, as recited in the claims of the present application.

Instead, **Wu** teaches "applying a diffuse reflectance spectrum to a fluorescence spectrum" in order to remove scattering effects. For example, **Wu** states at column 3, lines 3-7, "..the distortion in a fluorescence spectrum caused by the interplay of scattering, absorption, ... can be precisely removed by measuring the diffuse reflectance spectrum ...[emphasis added]." Thus, **Wu** teaches away from use of the reflectance data itself in a tissue classification scheme (the effect of light scattering evidenced by diffuse reflectance spectra is removed).

Also, **Wu** does not teach screening a plurality of test specimens for a first known condition using fluorescence spectral data and then, "for at least one of said plurality of test specimens for which said screening step is not determinate of said test specimen having said first known condition: ... classifying said test specimen based on said processed reflectance spectral data," as recited in each of independent claims 24 and 38 [emphasis added]. There is no such screening step taught or suggested in **Wu**.

Utzinger does not teach or suggest the steps missing from **Wu**. None of the methods in **Utzinger** discloses screening specimens for a given condition using fluorescence data with illumination at one excitation wavelength, and, where the result is not determinate, using reflectance spectral data to classify the specimen.

Furthermore, **Utzinger** appears to teach away from the use of fluorescence data obtained at a single excitation wavelength ("[t]he performance of fluorescence algorithms based on a single excitation wavelength was lower than that for two and three excitation wavelengths" at col. 62, lines 29-32). **Utzinger** also appears to teach away from the use of reflectance data in combination with fluorescence data ("incorporation of any of the four types of reflectance spectra did not improve performance" at col. 62, lines 25, 28-29, and 34-35). Even though **Utzinger** describes use of an algorithm with both fluorescence and reflectance data, nowhere in **Utzinger** is it suggested to use fluorescence to screen the sample for a given condition, and, if classification is indeterminate, use reflectance data to classify the specimen, as recited in claims 24 and 38.

Therefore, the combination of **Wu** and **Utzinger** does not teach or suggest all of the limitations of either of independent claims 24 and 38, and claims 24 and 38 are patentable in light of the art. Likewise, because a dependent claim includes all the limitations of the independent claim from which it depends, Applicants assert that all pending dependent claims are patentable in light of the art.

Claims 32-34 and 42-44 are patentable over **Wu** in view of **Utzinger** and **Gombrich**

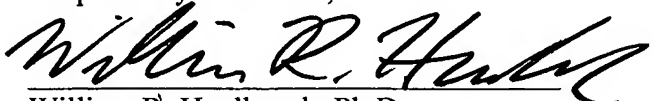
Gombrich does not teach or suggest the elements of either of independent claims 24 or 38 that are missing in **Wu** and **Utzinger**. As discussed in detail in Applicants' Response dated February 24, 2006, **Gombrich** does not teach or suggest screening specimens for a given condition using fluorescence data with illumination at one excitation wavelength, and, where the result is not determinate, using reflectance spectral data to classify the specimen.

Each of claims 32-34 and 42-44 depends either directly or indirectly from claim 24 or 38, and includes all of the limitations of the respective independent claim. Therefore, claims 32-34 and 42-44 are patentable over the cited art, at least for this reason.

Conclusion

Applicants respectfully request the reconsideration and withdrawal of the rejections of claims 24, 26–34, 36–38, 40–44, 46, 47, and 49-52, and Applicants request that these claims be allowed in due course. The Examiner is hereby cordially invited to contact Applicants' undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully submitted,



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